Allocating Scholarships for Army ROTC

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The research described in this report was sponsored by the United States Army, Contract No. DASW01-96-C-0004.

Library of Congress Cataloging-in-Publication Data

Goldman, Charles A., 1964-
Allocating scholarships for Army ROTC / Charles A. Goldman and Michael G. Mattock ; with Joann Davis ... [et al.].
p. cm.
"Prepared for the U.S. Army by RAND's Arroyo Center."
"MR-1069-A."
Includes bibliographical references (p.).
ISBN 0-8330-2746-8
1. United States. Army. Reserve Officers' Training Corps.
2. College students—Scholarships, fellowships, etc.—United States. I. Mattock, Michael G., 1961- . II. Title.
U428.5.G45 1999
355.2'232'071173—dc21 99-23943
CIP

Published 1999 by RAND
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1333 H St., N.W., Washington, D.C. 20005-4707
RAND URL: http://www.rand.org/
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PREFACE

This report analyzes the Army ROTC scholarship program, using data from before and after a major change in scholarship values implemented in the 1995–1996 school year. Based on the analysis, we evaluate alternative scholarship plans for the future.

The research was sponsored by the Deputy Chief of Staff for Personnel and was carried out in the Manpower and Training Program of RAND Arroyo Center, a federally funded research and development center sponsored by the United States Army.

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SUMMARY

Scholarships are an important tool the Army uses to recruit and retain students in the Reserve Officer Training Corps (ROTC) program. Any scholarship program faces challenges because of the high and rising cost of college. In response to this challenge and limited Army budgets, Cadet Command has made a number of recent alterations in the scholarship program to try to sustain a sufficient number of scholarships to attract students in fulfillment of its mission to commission officers into the U.S. Army. This report analyzes those recent policy changes and their effect on students' acceptance of Army scholarships as well as the types of schools they choose to enroll in.

PURPOSE

This report has two purposes. First, it recommends a structure for evaluating scholarship programs. Our analysis suggests that the schools participating in the ROTC program fall into five categories: historically black colleges and universities (HBCUs), ROTC military colleges, other public colleges, prestigious private colleges, and other private colleges. Each category of school has desirable characteristics for the Army, but each attracts a different type of student and has a different cost structure. The report examines several criteria that may be used to assess the value of these different types of programs and considers the factors that influence the costs the Army faces in attracting students at each type of school.

The second purpose of this report is to explore reasonable options for structuring the scholarship program today. Based on an examination of student responses to past programs, the report offers four

ways the Army could structure its scholarship program. The report illustrates the effect of each alternative program across the five categories of schools.

Since the Army has not made definitive statements about the types of students or schools that it sees as desirable for ROTC, it is not possible to be more precise in recommending a scholarship program. Nonetheless, we believe that the structure we develop here provides a useful framework for both discussing the objectives of the Army's ROTC scholarship program and understanding the likely effects of alternative structures on key market segments.

FINDINGS

Cadet Command has concluded that the tiered scholarship program is not appropriate for the future. In this report, we recommend a structure for evaluating scholarship plan alternatives and describe four basic approaches. We describe the differences among the five school types described above. Each group of schools offers desirable characteristics to the Army, and each presents different considerations for marketing the scholarship program. The report explores criteria that the Army might use in assessing the value of each type of school program, based on the experience of graduates from those programs in the past.

Almost any reasonable scholarship plan provides substantial support for public colleges (except possibly expensive out-of-state tuition rates), HBCUs, and military colleges. What is difficult is balancing the costs and value of private school programs, both prestigious and other.

We present four basic ways the Army could denominate its scholarships. Three of these are possible today: a single $16,000 cap, two caps of $12,500 and $20,000, and a plan that pays 100 percent at schools up to $12,500 and 80 percent for expensive schools. The one-cap plan is generous to nonprestigious private schools but provides very low support for prestigious privates. The two-cap plan has the potential to provide the most number of scholarships and very good coverage of all types of schools. But the two-cap plan requires determining which schools will receive the higher cap and relies

heavily on incentives to maintain enrollments at other private schools operating under the lower cap.

An alternative that does not require drawing up a prestigious private list is to return to the policy of paying full tuition up to a specified amount (we use $12,500) and then 80 percent of tuition for more expensive schools. The school-based management plan being implemented in 1998 will allow Cadet Command to control its budget much more effectively than was possible under the old 80 percent scholarship plan, where students had unrestricted choice of school. That policy change, combined with school closures and mission reductions since 1995, makes an 80 percent plan feasible today.

Although it would reduce funds available for students at more expensive schools, we have also presented a plan that would offer greater values to in-state students at public schools—a large and cost-effective market for potential expansion, especially if tuition increases in the private schools do not abate in the decade ahead. These offers would require congressional approval because the law currently prohibits the use of scholarships for room and board, which make up the largest portion of these in-state students' expenses to attend college. It may be desirable to start early to lay the analytical and policy groundwork that will be needed to persuade Congress to change the law.

ACKNOWLEDGMENTS

The authors would like to thank the staff of U.S. Army Cadet Command for its assistance in preparing databases and helpful discussion throughout the project. COL Toffler and his staff at the United States Military Academy offered helpful discussion and data resources. In addition, the analysis in this work benefited from discussions with the members of Cadet Command; the Office of the Deputy Chief of Staff for Personnel; Program Analysis and Evaluation Directorate; Personnel Command; and the Office of the Assistant Secretary of the Army for Manpower and Reserve Affairs.

This work also benefited from significant discussion at RAND with many colleagues, in particular from thoughtful comments by reviewers Dominic Brewer and Cathy Stasz. Nikki Shacklett made valuable contributions in editing several drafts of the manuscript.

GLOSSARY

AD	Advanced designee, a scholarship that does not begin paying immediately, but starts one year later
Cadre	Military personnel assigned to a particular university ROTC program
Cadet	Student participating in an ROTC program
Cadet Command	U.S. Army organization for ROTC
Contracted	A cadet is contracted when he or she signs a contract committing to Army service
HBCU	Historically black college/university
OML	Order of Merit List
PMS	Professor of Military Science, the commander of an ROTC school unit (battalion)
ROTC	Reserve Officer Training Corps
SMP	Simultaneous Membership Program
USMA	United States Military Academy

Chapter One

INTRODUCTION

BACKGROUND

The Army Reserve Officer Training Corps (ROTC) at America's colleges and universities has been an important source of commissioned officers. For most of its history, the program operated in parallel with the draft. Students enrolled in ROTC either because it was required by their institutions or as an alternative to being drafted. Over the past two decades, that paradigm has shifted: few colleges require ROTC, and the draft ended in 1972.

Thus, scholarships or other incentives are believed necessary to attract cadets into the program and to persuade them to remain until they are commissioned. Over the past decade, the number of commissions from the ROTC scholarship program has held relatively constant, but the number of cadets commissioned without scholarships declined from about 3,000 in 1984 to under 1,000 in 1994 (excluding cadets in the Simultaneous Membership Program).[1] In addition, because of rising school costs—especially the tuition charged at private colleges and universities—Cadet Command projected that the program would soon exceed the budget for scholar-

[1]The Simultaneous Membership Program (SMP) enrolls college students in ROTC and a National Guard or Reserve unit at the same time. They receive reserve drill pay and—once they have signed a contract—the ROTC monthly stipend. In many states, SMP cadets are eligible for incentives to reduce the cost of attending public colleges in their home state. SMP cadets, however, are *ineligible* for regular scholarships awarded by Cadet Command. Because of this ineligibility, we exclude these cadets from the calculations here.

ships. To commission the requisite number of cadets while staying within a constant budget, a new scholarship program was designed, called the tiered scholarship program. The program offered four tier levels with different scholarship values. The tiered program offered more scholarships; but because the total budget had to be kept constant, the average value of scholarships fell.

The tiered program resulted in a modest increase in enrollments at public colleges, and it enabled Cadet Command to control costs. However, many fewer of the most academically able students enrolled in ROTC, putting in jeopardy programs at the nation's most prestigious private colleges and universities. Cadet Command has concluded that the tiered program is not appropriate for meeting its needs. Researchers from RAND Arroyo Center have analyzed both the old and the tiered program to determine what lessons might be gleaned from these programs to assist in the design of a new one.

PURPOSE

This report has two purposes. First, it recommends a structure for evaluating scholarship programs. Our analysis suggests that the schools participating in the ROTC program fall into five categories: historically black colleges and universities (HBCUs), ROTC military colleges, other public colleges, prestigious private colleges, and other private colleges. Each category of school has desirable characteristics for the Army, but each attracts a different type of student and has a different cost structure. The report examines several criteria that may be used to assess the value of these different types of programs and considers the factors that influence the costs the Army faces in attracting students at each type of school.

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Since the Army has not made definitive statements about the types of students or schools that it sees as desirable for ROTC, it is not possible to be more precise in recommending a scholarship program.

Nonetheless, we believe that the structure we develop here provides a useful framework for both discussing the objectives of the Army's ROTC scholarship program as well as understanding the likely effects of alternative structures on key market segments.

APPROACH AND DATA

We approached the study by first determining what lessons we could learn from the old and tiered scholarship programs. We needed to determine how the program had changed over time, both in its structure and with respect to the type of students who were offered and accepted scholarships. We also wanted to determine how students and programs differed across the institutions that host ROTC programs. Finally, we wanted to develop some measure of the relative worth of programs in terms of their products, i.e., the officers they commission.

To accomplish the report's two purposes, we drew on both quantitative and qualitative data. Cadet Command provided quantitative information about the number and quality of cadets who accept scholarships. Cadet Command data files provide acceptance and quality information about the applicants for national scholarships from 1988 through 1995. We used the social security number information in these records to compare with subsequent years' cadet enrollment files (known as the BA7 files). If a student applied for a scholarship and then was coded as contracted in a subsequent enrollment file, we coded that student's record as an "acceptance." If we found no subsequent record of contracting, we coded that student's record as "nonacceptance."

Academic ability was measured by a standardized test score variable created by Cadet Command: it is the result of translating ACT scores to equivalent SAT scores, based on percentiles, and choosing the maximum of the test results if the student took the test more than once or took both the SAT and ACT.

Self-selection occurs since students must decide to apply for an Army ROTC scholarship. Thus we are likely to underestimate the difference between lower- and higher-ability students, compared to a model of preferences for students selected at random from the general population.

Other Cadet Command data files provide information about cadre assignments and costs of operating the program as well as data on the incentives offered by various schools. The Army's Officer Master File gives us information about post-commissioning behavior. In addition, we have limited data on the Air Force, Navy, and Marine Corps ROTC programs, and data on the characteristics of colleges from the National Center for Education Statistics.

To supplement the quantitative data, we gathered qualitative information through a series of field interviews. We visited the headquarters of the First and Second ROTC Regions, talking to the commander, members of the headquarters staff individually and in groups, and the brigade commanders. During our visits to campuses, we spoke to representatives from the cadre of eight ROTC programs in one group discussion per program, lasting about one to two hours. These field interviews enabled the project team to understand the experiences of the Army personnel who are implementing the program, in particular how students make decisions about college and financial aid. Appendix D reproduces the interview protocols.

HOW THIS REPORT IS ORGANIZED

Chapter Two gives some general background on ROTC and the context for college financial aid. Chapter Three describes the Army's tiered scholarship program. It also analyzes the effect of the tiered program on the types of students participating and the types of schools affected and draws lessons for future scholarship programs. Chapter Four expands the analysis of scholarship marketing at five specific types of schools and examines the value to the Army of programs at those schools. Chapter Five proposes and evaluates several comprehensive scholarship plans with the potential to support all types of schools, and it addresses some concerns about marketing in public colleges in the future. Chapter Six summarizes and concludes the report.

There are four appendices. Appendix A contains a detailed econometric analysis of acceptance rates for four-year scholarships. Appendix B documents the calculation of officer years of service. Appendix C describes the analysis and development of a scholarship plan targeted to prestigious private schools. Appendix D explains the collection of qualitative data in the field.

Chapter Two

ROTC AND CHANGES IN COLLEGE FINANCIAL AID

The ROTC program serves the interests of the military services and the needs of students. The Army, Navy, Air Force, and Marine Corps all have ROTC programs to identify and train college students to become officers in the active and reserve forces. Today, ROTC programs offer an important source of financial aid for college, helping students to attend and expanding their choices of affordable colleges. This chapter presents some of the basic structure of Army ROTC and reviews previous research about how students choose and pay for college.

ARMY ROTC

There are several entry points into Army ROTC for both scholarship and nonscholarship cadets. Figure 2.1 illustrates these entry points. The first is for high school seniors who apply for a national scholarship. These students are ranked on a national Order of Merit List (OML), and offers are made in order of the rankings. The Army offers two basic types of scholarships through this national process: four-year awards and three-year advanced designee (AD) awards. The four-year awards offer a certain scholarship amount for four years, as long as the student remains in Army ROTC. The three-year AD awards require the student to participate in ROTC but pay only in the student's second through fourth years. Students who receive any scholarship must contract with the Army when they begin receiving payments. Once contracted, the student is obliged to serve in the active or reserve forces after graduation. Minimum service is generally four years active duty or eight years reserve duty. If a student

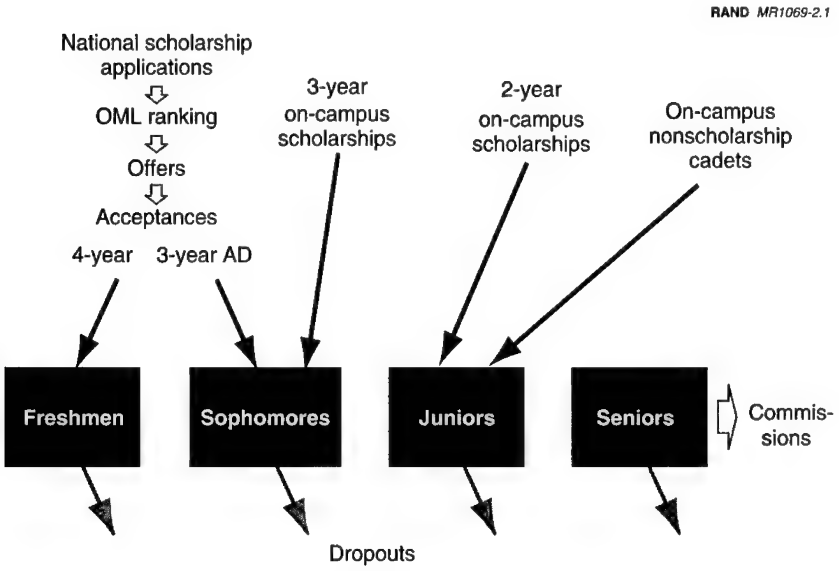

Figure 2.1—Army ROTC Contracting and Progression

breaks this contract, he or she must repay scholarship funds received by making payments to the U.S. Treasury, similar to a student loan. Students who receive four-year scholarships do not incur this obligation until their second year; the first year is a trial period for the student and for the ROTC program.

Once on campus, students who did not receive a national scholarship can apply for on-campus scholarships. Three-year on-campus scholarships are offered for students starting their sophomore year. Two-year on-campus scholarships are offered for students starting their junior year. If a student has not received a scholarship, he or she must contract as a junior or leave the program.

STUDENT CHOICE OF COLLEGE

Of particular interest to the Army is how the student makes his decision about which college to attend—and how the ROTC scholarship program might influence that choice. College-choice behavior can be segmented into three distinct phases: first, the decision of

whether to attend college; second, the selection of the set of institutions for consideration; and third, the actual choice of which school to attend.[1] Of these three phases, the most relevant to the Army are the latter two, for only students with college intentions are candidates for ROTC.

Although many factors enter into a student's preference formation, when determinants of student preferences are analyzed, academic quality predominates. The Cooperative Institutional Research Program has conducted an annual survey of a national sample of college freshmen for over 15 years. Survey results consistently show that the top reason students give for selecting a college is that [the college] "has a good academic reputation."[2] For high-ability students, the academic quality of an institution virtually overwhelms other factors, such as tuition cost. As one national study of academically able students concluded: "High-ability students tend to choose the college that they view most highly, almost regardless of the financial consequences."[3] By the time these students are applying to colleges, they already know which school they want to attend, and if it is at all feasible to attend that college, they will. Financial aid considerations play a secondary role in college choice.

Analyses conducted for this study demonstrate that higher-ability students express strong preferences for private colleges. Specifically, as SAT score increases, the likelihood of interest in private colleges increases by a large amount. Appendix A contains details of an analysis of eight years of ROTC scholarship applicants, who were requested to provide three schools of interest to them. That analysis indicates also that lower-SAT students, although less likely to prefer private schools, have increased their interest over the past decade.

The literature is broadly consistent with the experiences reported to us by the Professors of Military Science at prestigious private schools (private schools with the highest level of student SAT scores or selectivity). They observed that students applying to prestigious schools are often quite set on attending those particular institutions; what is

[1]St. John (1990), p. 173.

[2]Astin (1997), various pages.

[3]Chapman and Jackson (1987), p. 7.

variable is how they will *finance* their attendance at their school of choice. These students (often with the very active participation of their parents) will "shop" for the best financial package that they can secure. The financial channels explored include Army ROTC scholarships, government financial aid, school-based financial aid, athletic scholarships—and offers from the ROTC programs of other services.

TRENDS IN COLLEGE FINANCIAL AID

While academic quality rates as the key factor in college choice, college cost has increased in importance in recent years—not surprising, given the high rate of tuition inflation. Between 1987 and 1994 the cost of attending college increased faster than inflation by 29 percent for private colleges and universities and 21 percent for public colleges and universities.[4] However, as tuition costs have risen, so has financial aid to students. During this same period (1987–1994), the amount of government financial aid from federal, state, and local sources, as reported by institutions, increased 65 percent at public schools and 47 percent at private schools. The largest financial aid growth over this period came from the institutions themselves. Institutional aid increased 131 percent at public institutions and 106 percent at private institutions, all adjusted for inflation.[5] Thus the rates of growth in aid, especially institutional aid, outpaced the growth in tuition.

The basis for aid is also shifting. Increasing numbers of institutions award financial aid on a "no-need" basis—meaning not dependent on parental income. A College Board survey of four-year colleges found that 85 percent of private colleges offer some financial aid on a no-need basis; 51 percent of private colleges stated that their no-need awards "were used primarily as a recruitment device."[6] Another survey of institutions confirms this motivation: 80 percent

[4]CASPAR, 1987 and 1994 data, deflated by the GNP price deflator to constant dollars. Computed as the median increase over all institutions reporting valid data for both years. Costs include in-state tuition, dormitory room, and board. Rates are cumulative over the period rather than annual.

[5]CASPAR. These figures are national totals for private and public institutions.

[6]Chapman and Jackson (1987), p. 1.

of colleges awarding no-need aid stated that such awards were used either to a great extent or to some extent in their recruiting efforts.[7] Clearly, the competition for high-ability students is keen, and financial incentives are used explicitly to secure enrollments.

These practices have important implications for Army scholarships. Schools that offer no-need awards are generally willing to treat their scholarship offer and the Army's in combination, allowing the student to accept the Army's offer with additional money from the school. The Army ROTC scholarship program will save money when it can take advantage of the financial aid structure in this way. But at schools that do not offer no-need awards, students will forfeit any institutional award that is smaller than an Army scholarship offer, leaving the student with only the Army's award. Because the Army must essentially "buy out" the institution's aid offer to each student, it will cost the Army a substantial amount to offer competitive awards in these cases.

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[7]Chapman and Jackson (1987), pp. 1–2.

Chapter Three

LESSONS FROM PAST SCHOLARSHIP PROGRAMS

This chapter describes the old scholarship program, compares it with the current, tiered program, and describes the effects of the tiered program on students and school programs. We use these experiences to draw general lessons about how students interested in ROTC react to scholarship offers.

COMPARING THE OLD AND TIERED PROGRAMS

In the past, the Army offered scholarships of varying lengths and amounts. They could be for two, three, or four years. The amount of the scholarship was either $8,000 or 80 percent of the tuition, whichever was greater. As tuition increased, particularly at high-tuition private schools, the 80 percent provision made scholarships increasingly expensive. The program also offered a limited number of two-year $2,000 scholarships.

The tiered program, effective for the 1995 school year, abandoned the percentage-of-tuition approach. Instead, it established three tiers of scholarships that pay up to $12,000, $8,000, or $5,000 in tuition costs. In addition, it retained and increased substantially the number of $2,000 scholarships, now called Tier IV. Students already enrolled in ROTC programs were to keep their current scholarships under the old program. Table 3.1 compares the two programs.

The implications of the tiered program vary. At schools with tuition under $5,000—including in-state rates for most public schools—students receive the same coverage as under the old scholarship program. At schools between $5,000 and $15,000, students can receive

Table 3.1

Comparison of Old and New (Tiered) Scholarship Programs

	Old Program (before 1995–96)	New Program (1995–96 to 1997–98)	
2, 3, or 4 years	$8,000 or 80% of tuition	Tier I	$12,000
		Tier II	$8,000
		Tier III	$5,000
2 years	$2,000 limited number	Tier IV	$2,000 expanded number

more, less, or the same coverage depending on how the tier level compares with the school's tuition. However, students who want to attend schools with tuition over $15,000 will receive less tuition coverage with any of the new scholarships. Sometimes the tuition coverage will be substantially lower.

GENERAL FINDINGS ABOUT SCHOLARSHIP PROGRAMS

Analysis of historical scholarship data shows that the propensity of a student to accept an ROTC scholarship declines with higher SAT scores. This can be explained as a result of students with higher SATs having more opportunities to get financial aid. We do not find much difference between male and female students, but we found significantly different behavior for nonwhite students. Compared to white students, nonwhites were less likely to accept Army ROTC scholarships regardless of test score. For higher-scoring minorities, the effect is even more pronounced. High-scoring minority students are the least likely to accept the Army's offer.

Appendix A provides both method and details to support these conclusions. Appendix A also details an analysis that shows a strong association between higher SAT scores and student interest in private colleges and universities.

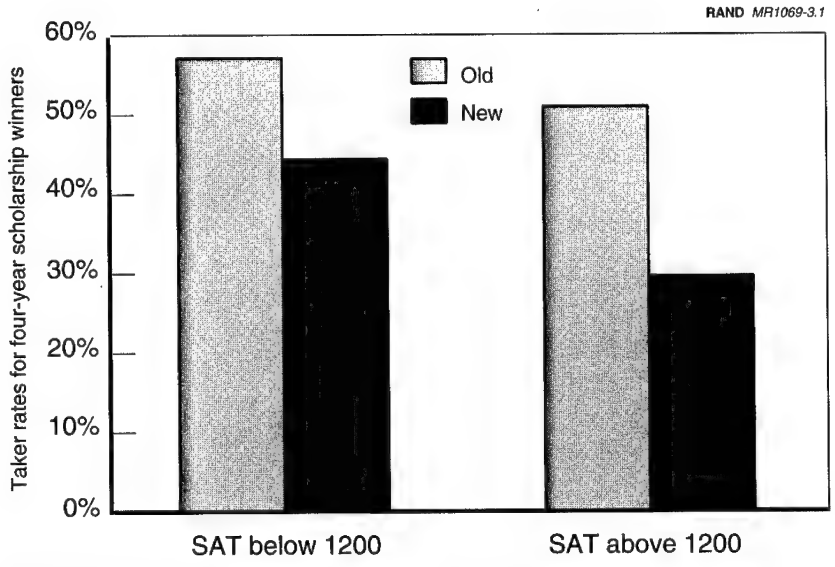
EFFECT OF TIERED PROGRAM

Focusing on the tiered program, we identified two related effects: it discouraged high-SAT students from accepting ROTC scholarships,

and it discouraged students who wanted to attend high-tuition schools from accepting scholarships,

Tiered Program Discouraged High-SAT Students

As shown in Figure 3.1, the acceptance rate declines for all students under the tiered program, but most strongly for high-SAT students. For students with SAT scores above 1200, the acceptance rate for a four-year scholarship offer fell by nearly half, declining from 51 percent under the old program to 29 percent under the new program. Lower-SAT students were also less likely to accept under the new program, but the effect is far less pronounced. Their acceptance rate declines from 57 percent to 44 percent. This program change appears to have had little effect on students scoring about 900 on the SAT.



NOTE: Old program is based on 1992–1994; new program is based on 1995.

Figure 3.1—Acceptance Rates Decline Under New Program, Especially for High-SAT Students

Appendix A contains a more technical analysis of this data, showing that the increased effect on high-SAT students is statistically significant at the 5 percent level, based on one year's data. Based on that analysis, we can examine the severity of the effect on very-high-SAT students. Under the old program, students with SATs over 1500 had about a 35 percent chance of accepting a four-year offer; under the tiered program, that rate declined to below 20 percent.

Tiered Program Discouraged Students at Expensive Schools

The changes in the scholarship program in 1995 left low-cost schools with the same scholarship values as before, 100 percent of tuition. However, students desiring to attend high-cost schools faced lower scholarship values. Our initial analysis showed that the tiered scholarship program left uncovered a significant portion of the costs for the more expensive schools. For example, Table 3.2 shows the cost of attending an expensive private college, Duke University, in 1995. These costs are typical of this group.

Table 3.3 shows the uncovered student costs under the tiered scholarship program at Duke. Financial coverage here includes the value of the scholarship, cadet stipend, and books allowance. No matter which tier of scholarship is awarded, a large portion of costs remains uncovered—more than half even for a Tier I scholarship winner.

Table 3.2

Example of 1995–96 Student Budget at Expensive Private College

Expense	Cost (1995–96)
Tuition and fees	$21,000
Room and board	$6,100
Books, personal, and travel	$2,200
Total	$29,300

NOTE: Amounts represent Duke University. Other expensive private colleges are similar.

Table 3.3

Uncovered Costs at Expensive Private College

	Tier I	Tier II	Tier III
Army scholarship winners admitted to the college	1	2	11
Of those, accepted the Army scholarship offer	1	0	1
Uncovered student cost	$15,500	$19,500	$22,500

The concern is that students, facing such a large cost, will either seek other financing to attend the school, and thus be lost to ROTC, or choose not to go to the high-tuition school. Data gathered from the first year's results confirm this concern. Very few scholarship winners chose to attend Duke on an Army ROTC scholarship. Only 2 of the 14 admitted winners enrolled in Army ROTC at Duke, as shown in Table 3.3. By comparison, in the previous year, 13 of 22 admitted winners enrolled at Duke under the old program, which paid 80 percent of tuition. The enrollment percentage under the tiered program—14 percent—compares with 59 percent under the old program. The Army faces stiff competition from the Navy and the Air Force. Both of those services offer 100 percent tuition scholarships at this school.

The decline in acceptances is higher at Duke than at some other expensive private colleges, but there is a widespread decline in scholarship takers at private schools during the first year of the tiered program, as shown in Table 3.4. As a group, the private schools had 45 percent fewer four-year scholarship winners accepting Army ROTC scholarship offers in 1995–96 compared with the average of the preceding three years. As shown in Table 3.4, in the categories of historically black colleges and universities (HBCUs), military colleges, and public colleges, the number of enrolling students in 1995–96 compares well with the numbers averaged over the preceding three years.

Table 3.4

Comparison of Acceptance Rates for Four-Year Scholarships

School Type	4-year Schol. Takers (1992–94)	4-year Schol. Takers (1995)	Change (%)	Average Tuition Gap (1992–94 program)	Average Tuition Gap (1995 program)	Difference
HBCU[a]	130	122	–6	$48	$446	$398
Military	45	44	–2	$823	$997	$174
Public	355	388	+9	$268	$584	$316
Private	428	234	–45	$2,740	$5,898	$3,158
Total	958	788	–18			
4-year offers	1,720	1,892	+10			
Taker rate %	56	42	–14			

[a]Historically black college or university.

Overall, the taker rate of scholarships decreased notably from the preceding three years, by 14 percent.[1] The lower taker rate is consistent with the hypothesis that students planning to attend a specific school will reject lower-valued scholarships when there is a large amount of uncovered cost to attend the school on an Army ROTC scholarship. Rather than switch to a less expensive school, these students do not enroll in ROTC.

Looking further at the 1995–96 taker rates, we can explain the results for the different school categories in terms of the students' out-of-pocket cost of attendance. For the HBCUs, public colleges, and military colleges, the average gap between tuition and scholarship coverage is less than $1,000. The average for the private schools is nearly $6,000.[2] That large gap is likely to account for the reduced enroll-

[1]In calculating the taker rate we counted as four-year offers all dual offers (where students had a choice of a four-year or three-year advanced designee scholarship). Including or excluding this group did not substantially change the overall taker rate for four-year offers.

[2]The computation of this gap takes into account the tier award a student received and the tuition of the school attended. Calculation of tuition for public schools is based on whether the student's state of residence on the scholarship application matches the state of the school chosen. Where the states match, the student is assumed to pay in-state tuition. In other cases, the student is assumed to pay the out-of-state rate. No school incentives are included in these calculations.

ment levels at these schools. In addition, from the old to new program the gap did not change much—only a few hundred dollars, on average—for HBCUs, public colleges, and military colleges. It increased by more than $3,000 for private schools.[3]

[3]The tuition gap for the 1992–94 program is based on what the 1995 four-year scholarship winners would have received individually under the old program ($8,000 or 80 percent of tuition). Thus, Table 3.4 compares what the same individuals would have received under the old and new programs. School incentives are not included under either tuition gap calculation.

Chapter Four

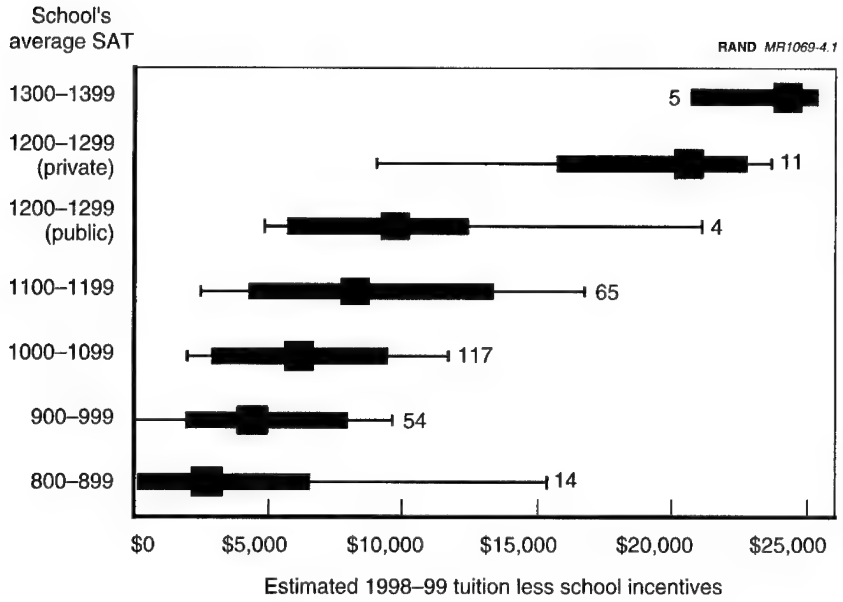
COST OF ATTRACTING STUDENTS

This chapter considers the types of schools offering ROTC scholarships with an eye to key marketing considerations. It also provides an indication of the quality of the programs at the different types of schools as measured by two output criteria.

For purposes of scholarship marketing, the most important features of schools are category—public or private—their academic quality, and whether they offer incentives. Many of the most prestigious private schools provide financial aid only on the basis of need, so they offer no incentives to assist Army ROTC scholarship winners. Most other private schools do offer incentives, ranging from small cash allowances to many thousands of dollars or free room and/or board.

To analyze these factors (public/private, academic quality, and incentives), we introduce a chart showing the range of uncovered tuition costs (tuition less school incentives) sorted by the average SAT score of graduates. For each SAT group (800–899, 900–999, etc.), we plot the median uncovered tuition cost and draw a line between the 25th and 75th percentile of the schools in that group. The result is shown in Figure 4.1.

The pattern is striking. Schools at the top of the chart have the most expensive values for tuition less school incentives, by a wide margin. Schools whose average graduates score below 1200 on the SAT have markedly lower values. All schools with averages above 1300 are private, as are most of those in the 1200–1299 range (11 out of 15). These prestigious private schools will be expensive ones at which to



NOTES: For each SAT group, median is indicated by a solid square. The heavy line ranges from the 25th to the 75th percentile. The lighter "whiskers" range from the 10th to the 90th percentile. The number next to each line shows how many host programs are in that SAT range.

Figure 4.1—Range of Uncovered Tuition Costs (Tuition Less School Incentives), by SAT Score of Graduates

maintain an Army ROTC presence. In contrast, most other schools can attract students to attend and enroll in ROTC with much lower Army scholarship values.

MARKETING SCHOLARSHIPS AT FIVE TYPES OF SCHOOLS

Considerations differ in marketing scholarships and attracting students at different types of schools. We describe five types of schools where Army ROTC is currently offered. The types include different combinations of tuition costs, SAT scores, and other special factors (specifically, racial composition and military service curriculum).

Prestigious Private Schools (and Some Out-of-State Publics)

The overwhelming majority of the nation's most prestigious colleges are high-tuition private schools.[1] In addition, many prestigious state schools have very high tuition for out-of-state residents. These schools, both public and private, offset their high tuition in cases of need, but generally not for other reasons. Therefore the Army is competing directly with financial aid offers from the schools.

Based on our initial analysis of the tiered scholarship program, we analyzed several alternatives for a higher-value scholarship targeted to students attending specific prestigious private schools. At the same time, Cadet Command recognized the effect of the tiered scholarship program on specific prestigious private schools and also concluded that higher-value scholarships would be needed to maintain the enrollments in these programs. The Army approved and implemented a plan known as "Tier IA scholarships" starting in the 1996–97 school year. Appendix C reports the analysis that contributed to the design of the plan and describes the plan implemented.

There are other ways to support these schools besides the Tier IA program, but all involve high scholarship values. Low scholarship values, as in the tiered scholarship program, will not generate sufficient enrollments at prestigious private schools to maintain the viability levels they had under the old scholarship program. (Programs with very few students are expensive and find it difficult to organize students into meaningful Army units for training and education purposes. A program is said to be *viable* if it enrolls sufficient numbers of students to offer robust training and educational activities for cadets. In the past, host programs had a requirement to graduate at least 15 students per year. Programs graduating fewer than 10–12 students per year are often said to be nonviable.)

[1]Of the 20 Army ROTC hosts with the highest SAT scores, 16 are private and 4 are public. The 16 private schools have tuition rates between about $16,000 and $25,000 per year.

Other Private Schools

Other private schools are a very different case, as Figure 4.1 shows. These schools typically offer merit-based (non-need) aid to students and are willing to supplement the Army's scholarship offer, reducing their potential net cost. Over 90 percent of these schools with Army ROTC host programs have offered incentives that supplement the Army's scholarship awards.

Most Public Schools

Most public schools, at least for in-state residents, have modest tuition charges that would be fully covered under virtually any four-year scholarship program. There are potential future concerns about expanding the in-state market at public schools. We treat these concerns in Chapter Five.

Historically Black Colleges and Universities

HBCUs form one special case. These institutions have had a long-standing relationship with Army ROTC and are a key pipeline for increasing representation of African-American officers. Special scholarships are targeted to these schools (although the scholarships are *not* targeted by race or ethnicity—anyone attending an HBCU is eligible).

ROTC Military Colleges

Another special case is the junior and senior military colleges. These colleges require some participation in ROTC for all enrolled students, although the students are not required to *contract* in an ROTC program. Because of this arrangement, these colleges offer a significant potential source of officers to the Army, and the Army has responded by targeting scholarships. There is a wide range of tuition rates, since some are inexpensive public colleges and some are expensive private colleges.

TWO MEASURES OF VALUE FOR ROTC PROGRAMS

Measuring quality of personnel is a complex and contentious process. However, the Army spends considerable effort in evaluating its officers. The results of these evaluations reflect directly in promotions and indirectly in longevity on active duty, since those not promoted eventually attrit. We examine two measures of value for ROTC programs: officer years of service and officer promotion rates.

Years of Service

As Table 4.1 shows, the Army gets somewhat less active-duty service from prestigious private schools measured over the first eight years of career—about a half-year less than students from public schools and about a quarter-year less than other private schools. The differences are statistically significant, owing to the relatively large number of officer records available for each school type. Appendix B documents the analysis underlying Table 4.1.

Promotion Rates

A good test of quality is the rate of selection for major, that is, the rate at which captains are promoted to major. (Selection for lower ranks

Table 4.1

Comparison of Lengths of Service over First Eight Years of Career

Type of School	Expected Years of Service (std. error)
Public	6.57 (0.006)
Prestigious private	6.13 (0.019)
Other private	6.42 (0.011)
HBCU	6.52 (0.017)
Military	6.65 (0.017)

NOTES: Year groups 84 and later included in computations. Calculations include service from date of entry through the eighth year of service. Standard errors are computed assuming independence of each single year transition rate.

is considerably less competitive.) On that criterion, students from prestigious private schools appear to be a good investment. As Table 4.2 shows, they are promoted to major at a (statistically) significantly higher rate. In fact, the promotion rates for captain, major, and lieutenant colonel are higher, and significant at the 1 percent level or better. The prestigious privates are the only group to display this consistent and strong pattern of significantly higher promotion rates. Other private schools and military colleges show one promotion rate at a high level of statistical significance. HBCUs show significantly *lower* rates of promotion at all levels, compared with public schools.

The below-the-zone selection rates, indications of the highest quality, are also higher for prestigious private graduates.[2]

Other Considerations

An additional argument has been made, especially in the case of prestigious private schools and prestigious public colleges (such as state flagship campuses). These campuses historically have produced large numbers of graduates who later move into influential positions. This characteristic could benefit the Army in one of two ways. Some number of the ROTC graduates from these institutions might not make the Army a career, but they could assume important positions in society later on. Having had military experience, they would be better situated to make informed judgments about defense and national security issues. Alternatively, they could serve as a source of information for former classmates in influential positions. Tracking the undergraduate degrees of recent members of Congress supports the proposition that prestigious private colleges are strongly represented in this sort of leadership position.

[2]For major, the rate of below-the-zone selection is 7.1 percent for prestigious private school officers versus 4.5 percent for public school officers. This difference is statistically significant ($p = .0047$). For military school officers, the rate is 5.9 percent, significantly different from the public rate ($p = .0218$). The rate for HBCU officers, 1.8 percent, is significantly ($p = .0000$) below the public rate. The rate for other private schools is not significantly different from the public rate. The differences in below-the-zone rates for lieutenant colonel are not statistically significant. There are no below-the-zone promotions for captain.

Table 4.2

Comparison of Selection Rates for Promotion

Rank	Public	Difference from Public Rates			
		Prestigious Private	Other Private	HBCU	Military
Captain	87.0% (N = 9,834)	**+4.6%** p = .0000 (N = 991)	+0.6% p = .3659 (N = 2,847)	**–6.9%** p = .0000 (N = 1,258)	+0.6% p = .5032 (N = 1,238)
Major	69.2% (N = 7,763)	**+9.6%** p = .0000 (N = 438)	+2.2% p = .0454 (N = 1,824)	**–6.7%** p = .0000 (N = 1,222)	+0.4% p = .8039 (N = 1,029)
Lieutenant colonel	62.1% (N = 5,038)	**+7.2%** p = .0067 (N = 336)	+2.2% p = .0965 (N = 1,371)	**–7.0%** p = .0001 (N = 721)	**+5.9%** p = .0006 (N = 789)

NOTES: Number of individuals considered by the boards (primary zone) in parentheses. FY88–95 promotion boards used in computation. Both below-the-zone and primary-zone board selections used to compute total promotion rates. P-values based on t-test of means between each group and the public school group. The test assumes both groups have equal variances set to the variance determined by the public schools. Differences in boldface are significant at the .01 level.

TRADEOFF BETWEEN STUDENT CHARACTERISTICS AND ROTC SCHOLARSHIP COSTS

If the costs of supporting students and programs at all five types of schools were equal, the Army would face relatively easy decisions. All five types of schools contribute to the Army's mission and to society at large. But the two criteria studied here viewed against costs make the Army's decision more difficult. There are tradeoffs in characteristics versus costs. Public colleges and HBCUs are the least expensive. Military colleges average more expensive tuition and hence scholarship costs. Private schools entail the highest costs, with prestigious privates the very highest. In addition, the prestigious private schools are the least generous with their own school-based incentives, potentially making them even more expensive to support for the Army.

SUMMARY

To recap the evidence in this chapter, prestigious private schools are the only type to display significantly high promotion rates at all grades in the standard 20-year career. They are responsible for a large share of representatives in the U.S. Congress and probably in many other social leadership roles. Their graduates do supply somewhat less service than other school types—about a half-year less than public school graduates over the first eight years of an Army career, and about a quarter-year less than other private school graduates.

Because of the attractiveness of prestigious private schools, many academically talented students strongly desire a college education at a specific prestigious school. The Army can attract a selection of these students only if it maintains relatively expensive ROTC programs at some of these schools, involving large scholarships.

Although the costs are less, the same issue arises at military colleges. The evidence on retention and promotions indicates that military school graduates stay longer and—eventually—are promoted at higher rates to more senior officer grades. But these programs are more expensive than alternatives at public schools.

Private schools—even those not prestigious—are potentially expensive for the Army. Their tuition rates are high. Almost all *nonprestigious* private schools offer incentives, potentially reducing the cost of scholarships to the Army. But the amount the Army pays depends on the interaction of its policy and the schools' policies. If the Army makes generous scholarship offers, it will pay more and the schools may pay less of tuition or divert their aid to room and board expenses. If the Army pays somewhat less, it can save money but must depend on the schools' incentives to attract students.

We explore this variation in Chapter Five, where we examine four different strategies for setting scholarship values. Each of the plans covers public schools, HBCUs, and military colleges well. These are the easy choices. The hard choices are how to allocate the budget to private schools, prestigious and not. The plans vary markedly in their support and costs for these schools.

Chapter Five

SCHOLARSHIP PLANS FOR THE FUTURE

As noted in the previous chapter, public schools, at least for in-state students, have low tuition rates. Those low tuitions are easily covered by the Army's scholarship program. Private schools present greater challenges, especially prestigious private schools that do not supplement Army scholarships with institutional funds. This chapter offers three alternative scholarship programs that enable the Army to fund scholarships at the five types of schools we identified in Chapter Four, although to varying degrees. Each plan remains within the current scholarship budget and will attract enough students to meet commissioning goals, as determined by a market model developed from the insights in Chapter Three. The chapter also addresses what we believe to be a potential problem at public schools and presents a more radical plan to offer some room and board coverage at these schools.

Because of administrative complexity and difficulties in marketing the tiered scholarships, Cadet Command desires to implement a school-based scholarship program. In some sense, this program generalizes and expands the Tier IA concept of matching students to likely schools, but at all types of schools. To accomplish this matching without huge administrative burden, Cadet Command is delegating much of the authority for awarding scholarships to qualified candidates to the Professors of Military Science (PMSs) at individual schools. The involvement of PMSs in selection and award may have other positive benefits. If the PMSs can select students who will stay and succeed better than was the case with national scholarship selection boards, the ROTC scholarship program will benefit from the improved retention. Fewer dropouts will leave more funding

available for scholarships, allowing increases in the number of scholarships or in the awarded values.

The earlier analysis indicates that prestigious private schools need something like 80 percent tuition coverage to continue attracting students at a rate similar to that before the introduction of tiered scholarships. This desired level could be implemented as a cap of about $20,000 or a percentage of tuition: 80 percent or higher.

The schools below 1200 SAT in Figure 4.1 (page 20) have tuition cost (less school incentives) generally in the range of $10,000–13,000 or less.[1] Thus, these schools and their students may be well served by a strategy different from the Tier IA plan implemented for prestigious private schools. Cadet Command proposed a system with a single cap of $16,000.[2]

The scholarship budget for school year 1998–99 is $72 million. Within that budget, many combinations of scholarship allocations are possible. We present four alternatives. The first alternative is a single cap of $16,000 and is similar to Cadet Command's proposal.[3] The second alternative is a two-cap system. The third alternative implements a program in which each school's coverage is at least 80 percent of its tuition; less expensive schools have full tuition coverage. Following these options, we discuss and consider a more radical plan that includes room and board coverage as an incentive to expand the market penetration of in-state students at public colleges.

COMPARING SCHOLARSHIP PLANS

To estimate the market potential of the alternative plans, we devised a model of the market acceptance of scholarship plans at each school

[1]Recall that the heavy line in the figure displays the 25th to 75th percentile, so a quarter of the schools in each SAT range are above the high end of the line. A quarter are also below the low end. The lighter line indicates the 10th and 90th percentiles.

[2]This plan was modified to offer schools in the past Tier IA an option to have $20,000 scholarships instead of $16,000. If the schools elected the $20,000 value, they received fewer scholarships and lost the opportunity to compete for unawarded $16,000 scholarships in the school-based plan.

[3]The $16,000 plan analyzed here does not include the effects of allowing certain schools to elect a limited number of $20,000 scholarships instead of the $16,000 level.

where the Army maintains an ROTC program. The model uses historical data from before the introduction of tiered scholarships to estimate the market size for the four scholarship plans described above.

The model is broadly consistent with the evidence examined in Chapter Three, but it is simple: it proceeds school by school, examining the planned Army offer plus existing school incentives. If the total coverage is 80 percent or more, then the market is set equal to the historical average under the $8,000 or 80 percent plan, immediately before the introduction of tiered scholarships. If the total coverage falls below 80 percent, no students are counted in the market. Although this approach is obviously simplistic, the aggregation over many schools serves to smooth out the rigid breakpoints. The market estimates may not be fully accurate, but they provide a way to compare plans. In other words, all of these market estimates could be high or low by a roughly similar amount.

We report the results of the model in Tables 5.1 through 5.4. Each table lists the five school categories and shows the percentage of schools in each category whose in-state and out-of-state tuition is covered at least 80 percent by the specified plan, including school incentives currently in place. Based on the historical data, the table reports the number of scholarships that we estimate could be marketed at the schools in each category. The model computes the cost of each school's in-state and out-of-state scholarships based on the specified plan (providing coverage is at least 80 percent). Aggregating the individual schools in each category, we compute the average scholarship cost in the category. If the entire estimated market could be fully supported using these average cost figures within the total of $72 million, then the Army could fund all of the estimated market and we would use the estimated market as the actual allocation. In fact, these plans would all exceed the total budget if the market were saturated. Therefore, we must offer somewhat fewer scholarships in at least one school category. Because of the key tradeoffs involved in. supporting students at private schools, we generally reduce the offerings in 'other public' schools.

Different adjustments are certainly possible by reducing other categories. When reducing the allocation, we do not adjust the average scholarship cost. We do not take into account that the Army might

select certain schools to emphasize or close in making decisions about the scholarship program. Instead we assume that reductions occur proportionally throughout that market segment. It might be possible to gain great value by concentration on cheaper parts of a specific segment, for example on in-state rather than out-of-state students. We do not analyze those possibilities here.

ALTERNATIVE APPROACHES FOR A SCHOOL-BASED PROGRAM

The $16,000 Cap Alternative

Table 5.1 shows our estimates of the distribution of scholarships under a single cap of $16,000. The cap represents the maximum amount of coverage for any scholarship; in no case does the scholarship value exceed the actual tuition charge at a school. To the extent that many schools have tuition rates below the cap, the average cost is less than the cap.

The $16,000 single cap favors other private schools. This plan has an estimated market of 9,672, and we are able to fund about 9,600

Table 5.1

$16,000 Scholarship Allocation Plan

	Schools Covered ≥ 80%					
School Type	In-state	Out-of-state	Estimated Market	Number of Schol.	Average Schol. Cost ($)	Total Cost ($ millions)
HBCU	100%	100%	694	694	5,680	3.9
Military	100%	100%	1,222	1,222	7,254	8.9
Other public	100%	99%	6,075	6,010	5,908	35.5
Prestigious private	38%	38%	195	195	15,949	3.1
Other private	96%	96%	1,485	1,485	13,879	20.6
Total	96%	95%	9,672	9,607	7,499	72.0

scholarships under the current budget amount.[4] The total of 9,600 scholarships is equivalent to about 3,200 new scholarships each year, lasting two to four years each.[5] A principal effect of this plan is the relatively few scholarships at prestigious private schools owing to only 38 percent of prestigious privates being covered at least 80 percent of tuition.

The Two-Cap Alternative

The second plan sets two caps, dividing private schools into two groups: $12,500 and $20,000. This plan could fund 9,700 scholarships—about 90 more than the $16,000 single cap (or about 30 more per year). This plan's allocation is shown in Table 5.2.

Table 5.2

$12,500/$20,000 Scholarship Allocation Plan

	Schools Covered ≥ 80%					
School Type	In-state	Out-of-state	Estimated Market	Number of Schol.	Average Schol. Cost ($)	Total Cost ($ millions)
HBCU	100%	100%	694	694	5,680	3.9
Military	100%	100%	1,222	1,222	6,775	8.3
Other public	100%	98%	6,005	5,920	5,739	34.0
Prestigious private	94%	94%	525	525	19,327	10.1
Other private	85%	85%	1,338	1,338	11,735	15.7
Total	97%	96%	9,826	9,699	7,427	72.0

[4]In these calculations, we use the current budget amount of about $72 million for 1998–99, but we calculate allocations based on a steady state. Each year enough new offers would be made to keep this amount level. In the first three years, there would be some transition effects because of obligations to the old scholarship winners, but these would be unlikely to have a large impact on the budget since the new scholarship values are almost all higher than the tiered scholarships.

[5]The total of 9,600 indicates the number of active scholarships being paid to all students, freshmen through seniors. Historically, the average scholarship has lasted about three years, so having 9,600 scholarships requires 9,600/3 = 3,200 scholarships being awarded per year. The exact average duration depends on both the offer structure and scholarship winner retention.

This plan favors prestigious private schools by offering smaller scholarship amounts at other private schools and taking advantage of the school-based incentives offered there. The two-cap plans separate private schools into two groups—a high-value scholarship group and a lower-value one. This decision could be based on SAT scores alone, as we have done in this example, or on another basis.

The 80 Percent Alternative

If the Army would rather not make this decision, a plan paying 80 percent of tuition is feasible, with full tuition coverage up to $12,500 (or a lesser amount, if desired). This plan, shown in Table 5.3, would pay full tuition for schools with tuition up to $12,500. For schools with tuition between $12,500 and $15,625, the plan would pay $12,500. For schools with tuition over $15,625, the plan would pay 80 percent of tuition. This plan offers about 100 scholarships less than the $16,000 single cap, or about 30 less per year. The $12,500 cap could be reduced to provide somewhat more scholarships.

FUTURE CONCERNS SPECIFIC TO PUBLIC SCHOOLS

Two-thirds of college students attend public schools, and historically the Army has attracted many officers from public colleges and uni-

Table 5.3

$12,500/80 Percent Scholarship Allocation Plan

	Schools Covered ≥ 80%					
School Type	In-state	Out-of-state	Estimated Market	Number of Schol.	Average Schol. Cost ($)	Total Cost ($ millions)
HBCU	100%	100%	694	694	5,680	3.9
Military	100%	100%	1,222	1,222	6,836	8.4
Other public	100%	100%	6,093	5,460	5,866	32.0
Prestigious private	100%	100%	557	557	14,709	8.2
Other private	100%	100%	1,574	1,574	12,392	19.5
Total	100%	100%	10,141	9,508	7,575	72.0

versities. But we believe that the Army may be limited in its future ability to attract in-state students from public schools because of low scholarship offers. In the case of in-state students at public schools, these offers are not necessarily the result of Army policies but rather reflect congressional restrictions on the use of scholarship funds.

Figure 5.1 illustrates the situation, using the average in-state expenses for resident students at public four-year colleges in 1998–99.[6] The Army can legally use scholarship funds only to pay for tuition and required fees. The $150-per-month stipend and the books allowance, currently $450 per year, can be applied to the student's other expenses. As a result, the average in-state scholarship student at a public school gets coverage for only half of his total budget even with a "full" scholarship.

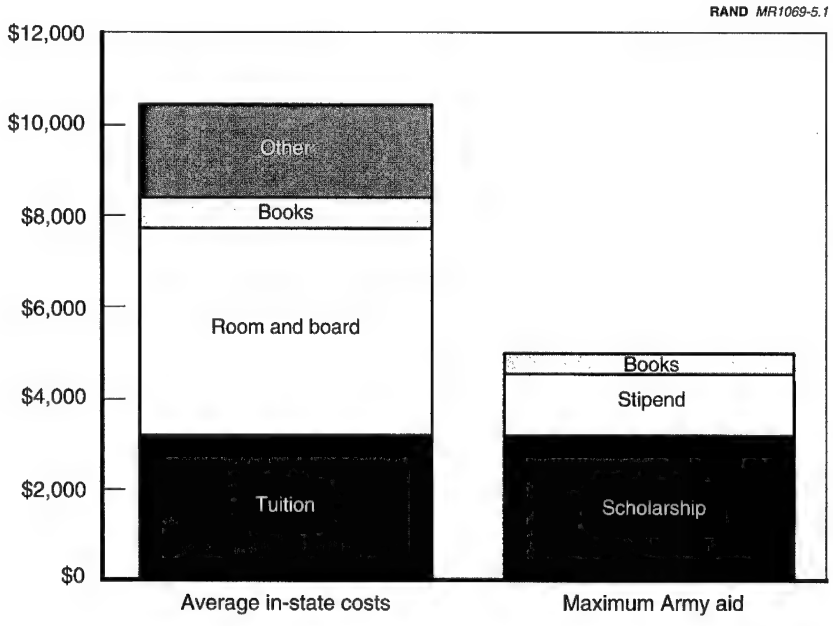


Figure 5.1—Public College In-State Costs Compared to Allowed Army Aid, 1998–1999

[6]Source: College Board (1998).

We are concerned about this level of funding because of trends in student life. Costs are increasing; consequently, financial aid is becoming more crucial and students are working more and graduating more slowly. Figure 5.2 shows that the number of full-time students working has increased over the past 20 years, most sharply for students working over 20 hours a week. These work commitments compete with academic progress and with ROTC participation.[7]

Figure 5.3 shows that students are taking longer to graduate. Twenty years ago, almost half of students graduated within four years. Today, that figure is 30 percent.[8] Because students find it harder to pay for school, they take on work responsibilities. This, in part, accounts for the delay in graduation.

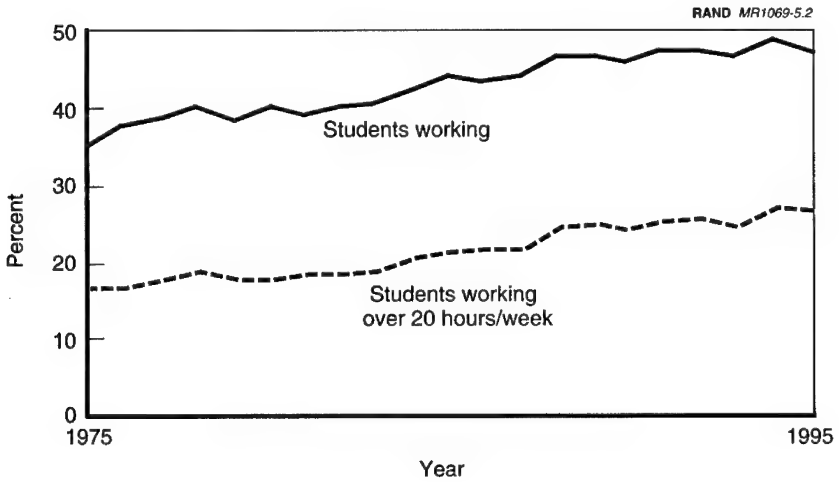


Figure 5.2—Students Working More, 1975–1995

[7]NCES, *The Condition of Education, 1996* (October 1996 Current Population Survey Data). Data are for all full-time students.

[8]NCES, *The Condition of Education, 1996*. Data are for all students. Public students take longer than private students to graduate based on data for recent years, although data are unavailable for earlier years.

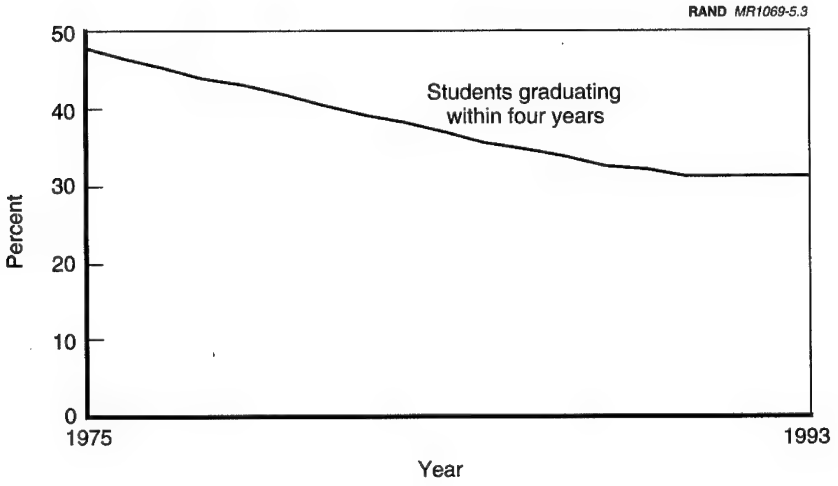


Figure 5.3—Students Graduating More Slowly, 1975–1993

The Two-Cap Alternative with Some Room and Board Coverage

To address these concerns and trends, we show an alternative scholarship allocation consistent with the current budget. This plan is similar to the one shown earlier in Table 5.2, but with a $10,000 cap for most schools and a $20,000 cap for prestigious privates. The modified plan, shown in Table 5.4, expands the earlier plan by allowing (primarily in-state) students at low-cost public schools to have up to $5,500 in total coverage for tuition, room, and board (not counting the books allowance or stipend, which they also receive). For a school with an average tuition of about $3,500, this leaves $2,000 in additional coverage for room and board.[9] Students at schools with

[9]This plan provides coverage for about two-thirds of the student's total budget, about the same fraction of a prestigious private school student's budget covered under the $20,000 ROTC scholarships.

Table 5.4

$10,000/$20,000 Scholarship Allocation Plan with Some Room and Board Coverage

	Schools Covered ≥ 80%					
School Type	In-state	Out-of-state	Estimated Market	Number of Schol.	Average Schol. Cost ($)	Total Cost ($ millions)
HBCU	100%	100%	1,010	1,010	6,411	6.5
Military	100%	100%	1,775	1,775	6,762	12.0
Other public	100%	90%	8,717	5,840	6,289	35.7
Prestigious private	94%	94%	525	420	19,327	8.1
Other private	68%	68%	1,129	900	9,652	8.7
Total	93%	87%	13,155	9,945	7,352	72.0

NOTE: Students (primarily in-state but also out-of-state) allowed up to $5,500 total for tuition, room, and board at low-cost public schools where tuition is below $5,500. Market expansion estimated for in-state students only using a market elasticity of 1 with respect to scholarship value.

tuition over $5,500 receive no coverage for room and board, but they can cover full tuition up to $10,000.

Fitting this plan within the current budget, we find that the number of scholarships drops at nonprestigious private schools and increases at public schools, just as we intended. Compared to the $12,500/$20,000 plan, we have shifted about 500 scholarships away from private schools and created about 800 scholarships at public schools (including potentially many at public HBCUs and public military colleges, if desired). This results in a net gain of about 300 scholarships. The funding for the new room and board payments is covered by a reduction in the average scholarship at nonprestigious privates by about $2,000 in comparison to the $12,500/$20,000 plan.

The market estimates suggest that even more scholarships could be created and awarded at public colleges by further reducing the number of scholarships at private schools under this plan.[10] For example,

[10]The ability to market new scholarships at public colleges is dependent on the market elasticity of demand with respect to scholarship value at public colleges. If our

about 900 scholarships could be shifted away from private schools and about 1,500 created at public schools for a net gain of 600 scholarships. This plan also gives the Army future flexibility to expand production by marketing more in-state scholarships at public colleges with an average cost of $5,500 or less rather than the higher costs of marketing to students at private schools or out-of-state students at public schools.

SUMMARY

Table 5.5 summarizes the benefits and drawbacks of each of these plans. Of all the plans, the two-cap plan with some room and board coverage has the greatest potential to offer a large number of scholarships, at least 300–600 more than the other plans. But this increase comes at the cost of support for private school programs, either prestigious or nonprestigious privates.

Among the three plans that do not include room and board, the $12,500/$20,000 plan offers the most number of scholarships. This plan, however, has the least support for nonprestigious private schools, where incentives are very important to maintaining enrollments. The $16,000 one-cap plan offers the weakest support for prestigious privates and the greatest for nonprestigious privates. This plan minimizes the value of school incentives: the Army may effectively be buying out incentives at many schools.[11] It also may have budget vulnerability because it must cover tuition increases at all schools whose tuition rates are below $16,000 even if the nominal cap is not adjusted over time.

Overall, the $12,500/$20,000 plan gives the Army the most for its money, but with the greatest disparity among schools. The $12,500/80 percent offers a few less scholarships, but the plan does not dis-

assumption of an elasticity of 1 is too optimistic, then the actual market is smaller than we predict, although the illustration in the table is conservative in that it does not come close to taking advantage of the full estimated market. Note that we charge the cost of room and board payments for out-of-state students (where the total remains below $5,500) as a cost but do not impute *any* market expansion in the out-of-state market. This cost is about $0.3 million.

[11]Schools may choose to offer some of their savings in the form of supplemental incentives such as room and board coverage. Although this would offer more resources to the student, the Army would also have to pay more.

Table 5.5

Comparison of Scholarship Allocation Plans

Criterion	$16,000	$12,500/ $20,000	$12,500/ 80%	$10,000/ $20,000 (with room and board)
Number of scholarships	9,607	9,699	9,508	9,945
Prestigious privates covered ≥ 80%	38%	94%	100%	94%
Average scholarships at other privates	13,879	11,735	12,392	9,652
Importance of incentives	Moderate	High	Moderate	High
Budget vulnerability	Moderate	Low	Moderate	Low

criminate among schools (except to the extent that they have different tuition rates). It offers the Army a compromise between strong emphasis on school incentives and support for prestigious private schools, though the 80 percent tuition coverage does increase exposure to tuition inflation. Since the Army has eliminated marginal ROTC programs at expensive schools already, it is not at risk of paying high costs to support weak programs, as it was several years ago. That fact, combined with a reduced overall need for scholarships because of a cut in mission of 800 commissions per year, means that an 80 percent coverage plan that was unworkable in 1995 could work today.

Since the law does not currently permit the use of scholarship funds for nontuition charges, the Army may want to lay the groundwork today for expansion of the scholarship program to include room and board. The potential for a larger number of scholarships at lower average cost is likely to become increasingly important as tuition rates continue to escalate faster than inflation, while the Army's budget increases at most at the rate of inflation, possibly less.

Chapter Six

CONCLUSIONS

In this report we propose a structure for evaluating scholarship plan alternatives. We describe the differences among five school types: historically black colleges and universities (HBCUs), ROTC military colleges, other public colleges, prestigious private colleges, and other private colleges. Each group of schools offers desirable characteristics to the Army, and each presents different considerations for marketing the scholarship program.

Analysis of historical scholarship data shows that the propensity of a student to accept an Army ROTC scholarship declines with higher SAT scores. High-SAT students, as we demonstrate, have higher preference for private colleges and universities, which have higher costs. Although these higher costs might make such students more interested in ROTC scholarships, we believe that they have more alternate opportunities for financial aid besides Army ROTC, including especially the financial aid offers of the private colleges themselves.

We do not find much difference between male and female students, but we found significantly different behavior for nonwhite students. Compared to white students, nonwhites were less likely to accept Army ROTC scholarships regardless of test score. For higher-scoring minorities, the effect is even more pronounced. High-scoring minority students are the least likely to accept the Army's offer. To a great extent, the Army is able to bolster its minority enrollment by targeting scholarships to HBCUs. In the future, it may be wise to consider targeting to other heavily-minority schools if bolstering minority enrollment is important for other groups besides African-Americans.

Some of these school types present more challenges than others for a scholarship program. As documented in Chapter Five, almost any reasonable scholarship plan provides substantial support for public colleges (except possibly expensive out-of-state tuition rates), HBCUs, and military colleges. What is difficult is balancing the costs and value of private school programs, both prestigious and other.

Chapter Five presents three basic ways the Army could denominate its scholarships: a single $16,000 cap, two caps of $12,500 and $20,000, and a plan that pays 100 percent at schools up to $12,500 and 80 percent for expensive schools. The one-cap plan is generous to nonprestigious private schools but provides very low support for prestigious privates. The two-cap plan has the potential to provide the most number of scholarships and very good coverage of all types of schools. But the two-cap plan requires determining which schools will receive the higher cap and relies heavily on incentives to maintain enrollments at other private schools operating under the lower cap.

An alternative that does not require drawing up a prestigious private list is to return to the policy of paying full tuition up to a certain amount (about $12,500) and then 80 percent of tuition for more expensive schools. The school-based management plan being implemented in 1998 will allow Cadet Command to control its budget much more effectively than was possible under the old 80 percent scholarship plan, where students had unrestricted choice of school. That policy change, combined with important school closures and mission reductions since 1995, makes an 80 percent plan feasible today.

Although it would reduce funds available for students at more expensive schools, we have also presented a plan in Chapter Five that would offer greater values to in-state students at public schools—a large and cost-effective market for potential expansion, especially if tuition increases in the private schools do not abate in the decade ahead. These offers would require congressional approval because the law currently prohibits the use of scholarships for room and board, which are the largest portion of these in-state students' expenses to attend college. It may be desirable to start early to lay the analytical and policy groundwork that will be needed to persuade Congress to change the law.

Appendix A

MODELING THE ACCEPTANCE RATE OF FOUR-YEAR ROTC SCHOLARSHIPS

We conducted a more detailed analysis of the acceptance rate using a logit to model acceptance of ROTC scholarships. The model is described briefly below. (Logit models are broadly similar to ordinary linear regression, but they take into account that probabilities are restricted to be between zero and one by using the log of the odds ratio instead of the raw probabilities as the dependent variable.)

We employed a series of logit models to explore the relationship among student characteristics, scholarship offers, and acceptance behavior. These models allow us to discern what characteristics of students seem to influence their acceptance of the Army's scholarship offers. In all cases, the logit model operates with a dichotomous dependent variable: acceptance of the scholarship (as determined by the procedure described under "Data" in Chapter One).

The first model estimates acceptance as a function of a student's SAT score, interacted with demographic characteristics of the student and the year of the program. Thus for each effect there are two parameters, an intercept term and a slope term. The base effects are given by the Constant and SAT terms. The effect of the program year is given by terms like Year95 (intercept) and SAT95 (slope). Similarly, the effect of the demographics is given by terms like Female (intercept) and SATfem (slope). The program year is relative to a selected base year, 1994. The demographics are relative to white males. In addition to gender, we have data on broad race categories: white, black, and other.

Cadet Command awards scholarships to students with SAT scores of 850 and above. To make the terms easier to interpret, we trans-

formed the SAT variable by subtracting 800. Thus the intercept term represents the probability of accepting a scholarship at an SAT of 800. The slope term shows how much that probability changes as SAT score increases. The maximum attainable SAT score is 1600; the highest in our data is 1580. Table A.1 reports the results of the logit.

Table A.1

Parameter Estimates for Logit Model of Scholarship Acceptance: Full Model

Parameter	Estimate	Standard Error	Odds Ratio	z-value
Constant	1.03169	0.16920		6.10*
SAT	–0.00278	0.00036	0.9972	–7.74*
Year95	0.13201	0.20284	1.1411	0.65
Year93	–0.07828	0.19394	0.9247	–0.40
Year92	0.36660	0.19600	1.4428	1.87
Year91	0.66122	0.19768	1.9372	3.35*
Year90	0.20489	0.18768	1.2274	1.09
Year89	0.25786	0.19788	1.2942	1.30
Year88	0.46876	0.22936	1.5980	2.04*
SAT95	–0.00111	0.00046	0.9989	–2.39*
SAT93	0.00085	0.00043	1.0008	1.98*
SAT92	–0.00007	0.00044	0.9999	–0.16
SAT91	–0.00104	0.00045	0.9990	–2.34*
SAT90	–0.00043	0.00043	0.9996	–1.00
SAT89	–0.00061	0.00045	0.9994	–1.37
SAT88	–0.00098	0.00051	0.9990	–1.91
Female	–0.23584	0.09413	0.7899	–2.51*
Black	–0.30105	0.10935	0.7400	–2.75*
Otherrace	–0.43669	0.17459	0.6462	–2.50*
SATfem	0.00056	0.00024	1.0006	2.35*
SATblack	–0.00112	0.00040	0.9989	–2.80*
SAToth	–0.00006	0.00042	0.9999	–0.15

NOTE: * denotes effects significant at the 0.05 level. The total number of observations is 15,997. Log likelihood = –10640.126. The raw standardized test score had 800 subtracted from it to create the SAT variable, which is measured in combined SAT points.

Table A.1 shows that there are many significant effects of demographics and program year. In order to make more specific inferences, however, we believe it is appropriate to eliminate the insignificant terms from the logit. Eliminating these terms serves to reduce random noise that would otherwise make our estimates of effects less precise. For the basic results, this process makes no difference. In interpreting the results in more detail, we are reducing some errors where the model fails to find any association with the variables of interest. The re-estimated model appears in Table A.2. (Although the Year88 estimate is significant at about the 0.04 level in Table A.1, re-estimation without the other insignificant parameters made the Year88 estimate less precise, so we eliminated it from the model of Table A.2.)

We have illustrated the demographic variables' effects in Figure A.1. Using appropriate values of the indicator variables, we have plotted the predicted acceptance rates for white males, white females, and black males in 1994 using the estimates in Table A.2. For gender, the

Table A.2

Parameter Estimates for Logit Model of Scholarship Acceptance: Significant Parameters

Parameter	Estimate	Standard Error	Odds Ratio	z-value
Constant	1.22176	0.07737		15.79*
SAT	–0.00301	0.00017	0.9970	–17.88*
Year91	0.47785	0.13419	1.6126	3.56*
SAT95	–0.00101	0.00013	0.9990	–7.84*
SAT93	0.00051	0.00011	1.0005	4.49*
SAT91	–0.00083	0.00032	0.9992	–2.57*
Female	–0.23416	0.09303	0.7912	–2.52*
Black	–0.31994	0.10622	0.7262	–3.01*
Raceoth	–0.46743	0.06178	0.6266	–7.57*
SATfem	0.00056	0.00024	1.0006	2.40*
SATblack	–0.00108	0.00039	0.9989	–2.73*

NOTE: * denotes effects significant at the 0.05 level. The total number of observations is 15,997. Log likelihood = –10665.873. The raw standardized test score had 800 subtracted from it to create the SAT variable, which is measured in combined SAT points.

logit model yields significantly different intercept (Female) and slope (SATfem) estimates. But the intercept term is positive and the slope negative, relative to males. Thus, in the middle of the SAT range these effects cancel, as Figure A.1 shows. At the low end of the SAT range, females are slightly more likely to accept scholarships. The reverse holds at the high end of the SAT range. The effect on black students is much more pronounced. Here both the intercept and slope estimates are negative, relative to whites. The predicted acceptance rate for blacks is lower than for whites over the whole range, more so at the highest SAT levels.

These findings are very consistent with the predictions of human capital theory: higher-ability students, as measured by standardized test scores, are markedly less likely to accept an Army ROTC scholarship offer. We believe that self-selection into the sample means that there are probably more high-ability students that do not even apply for these scholarships. If that is true, then the differences in Figure A.1 understate differences we would observe in the underlying population of college-going students.

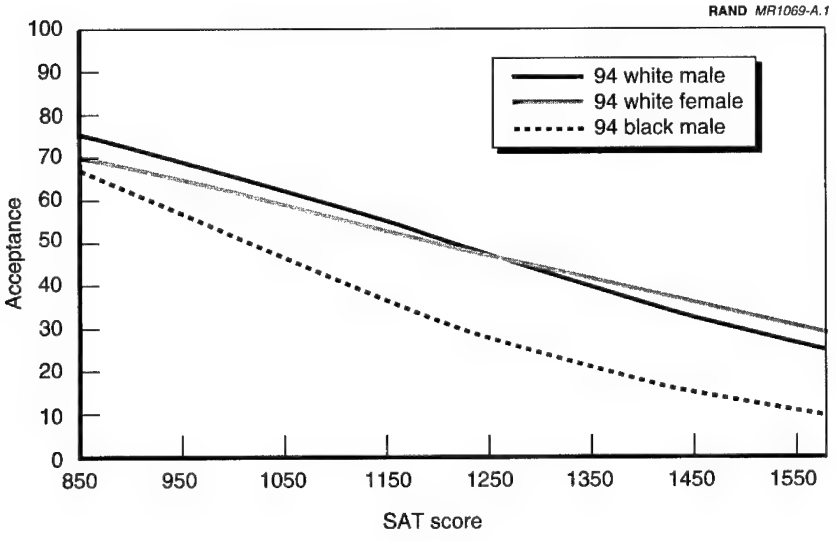


Figure A.1—Predicted Acceptance Rates by Gender and Race

Black students, and those in other nonwhite ethnic groups (not shown in Figure A.1), are notably less likely to accept the scholarships than are white students with equivalent test scores. It seems plausible that race would not significantly affect the opportunity costs faced by students of a given SAT level. But reports from the field suggest that nonwhite students, especially those of high academic ability, have more alternative offers for financial aid. We cannot rule out the possibility that a difference in taste for military service is at work. But given the self-selected nature of this sample and high participation of these minority groups in the enlisted force, we believe that tastes are not an important contributor to the behavior.

We now turn to the effect of the program change. Considering intercept and slope estimates, 1995 is the only year that shows significant negative effects. Although 1991 shows significant effects, the 1991 intercept term is positive while the 1991 slope term is negative. These effects tend to cancel. The 1993 slope term is significant, with a relatively small positive value, indicating that the effect of SAT score in that year was somewhat smaller than in other years, such as 1994 and 1992.

Because no other year displays the pattern of 1995, we conclude that the less generous program in that year was responsible for the effect. We have illustrated this with Figure A.2, which shows the decline in probability of acceptance of an ROTC scholarship with increasing SAT score. The dashed lines represent the standard error of the prediction (set at one standard deviation of the prediction above and below the point estimates). Because more of the scores are in the middle range, the standard errors are smallest in the mid-range and larger at the extremes. Loosely, we find a significant difference at a single SAT score where the dashed regions do not overlap. This is a much more stringent criterion than the logit itself, which analyzes the entire range of data to infer trends.

The dashed regions for the old program and tiered program overlap substantially for SAT levels of 850 to 1050, indicating that for low SAT scores, the difference in acceptance rates is not significant. As SAT increases, the dashed regions separate in Figure A.2, showing that acceptance under the tiered program falls off significantly faster than under the old program. As the standard errors increase, the dashed regions again overlap above the 1450 SAT level.

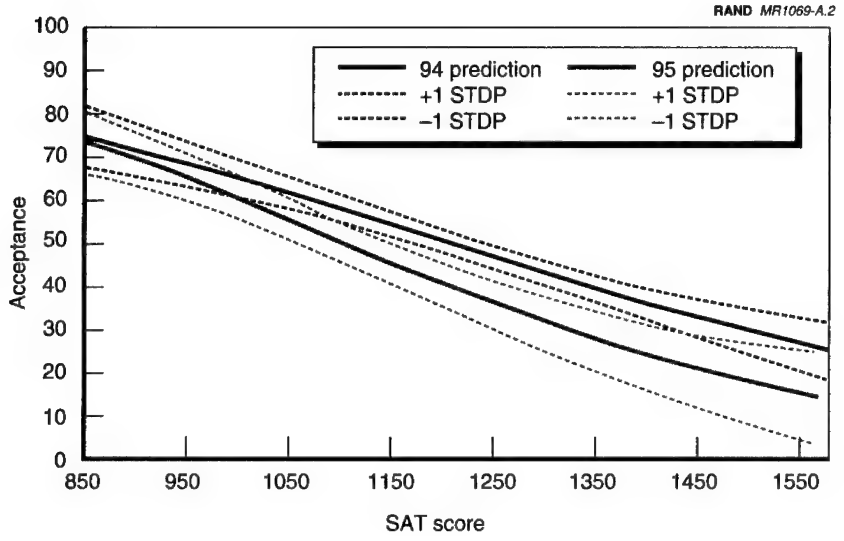


Figure A.2—Predicted Acceptance Rates, 1994 and 1995

We also investigated logit specifications with more complex functional forms for SAT score than the linear (intercept-slope) form. Although we were able to fit polynomials in SAT score, these did not represent any improvement to the curves fit with the specifications above. Further, the polynomial specifications have undesirable behavior at the low and high end of the SAT range.

In addition, we investigated students' preferences for private schools. On scholarship applications, students were asked to list up to three schools they had an interest in attending. We used a similar logit specification, with the dependent variable an indicator of whether the student selected one or more private schools among his or her named choices. In this case, we used only the 1988–1994 data to avoid any bias from the introduction of the tiered scholarship program. There is a very strong association between higher SAT scores and more interest in private schools. In addition, the logit results indicate that over time, there is evidence that lower-SAT students are increasing their preferences for private schools as well, although there is a significant upward slope in preference for all years studied. Figure A.3 illustrates the upward slope for 1992 and 1994, showing

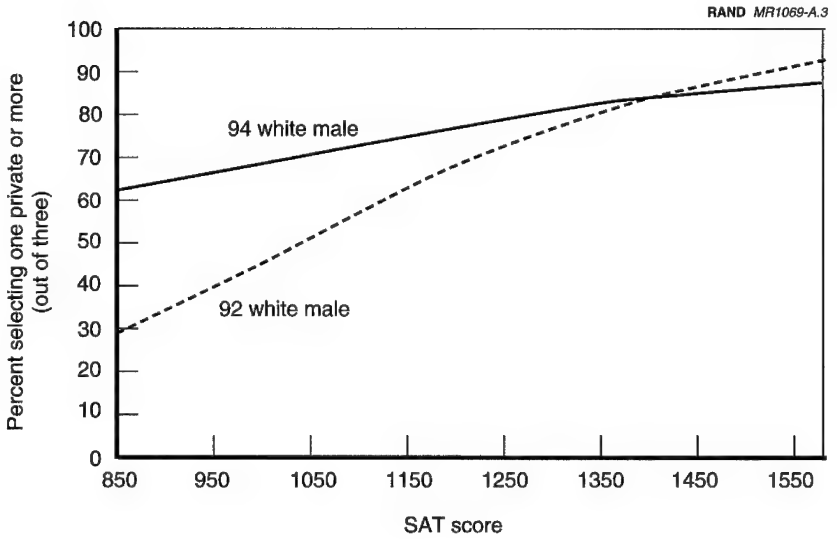


Figure A.3—Predicted Interest in Private Colleges and Universities

that the lower-SAT students in 1994 have higher preference for private schools compared to those in 1992. High-SAT students demonstrate strong preference for private schools in all years.

Table A.3

Parameter Estimates for Logit Model of Private School Interest: Full Model

Parameter	Estimate	Standard Error	Odds Ratio	z-value
Constant	0.37908	0.19548		1.94
SAT	0.00209	0.00043	1.0021	4.87*
Year93	–0.37090	0.21742	0.6901	–1.71*
Year92	–1.46506	0.22544	0.2311	–6.50*
Year91	–1.73679	0.22691	0.1761	–7.65*
Year90	–1.48662	0.21596	0.2261	–6.88*
Year89	–1.69706	0.22985	0.1832	–7.38*
Year88	–1.64403	0.27353	0.1932	–6.01*
SAT93	0.00054	0.00050	1.0005	1.07
SAT92	0.00248	0.00052	1.0025	4.75*
SAT91	0.00289	0.00053	1.0029	5.41*
SAT90	0.00255	0.00051	1.0025	5.01*
SAT89	0.00308	0.00054	1.0031	5.73*
SAT88	0.00302	0.00063	1.0030	4.78*
Female	0.25661	0.11630	1.2925	2.21*
Black	–1.68108	0.14480	0.1862	–11.61*
Otherrace	–0.36596	0.20408	0.6935	–1.79
SATfem	–0.00062	0.00030	0.9994	–2.03*
SATblack	0.00127	0.00048	1.0013	2.64*
SAToth	0.00139	0.00052	1.0014	2.66*

NOTE: * denotes effects significant at the 0.05 level. The total number of observations is 14,105. Log likelihood = –7845.02. The raw standardized test score had 800 subtracted from it to create the SAT variable, which is measured in combined SAT points.

Appendix B

COMPUTING OFFICER RETENTION

To shed light on the quality of service by ROTC officers who graduate from various types of schools, we analyzed data from the Army Officer Master File to compute retention rates on active duty for five school types. Using the retention rates, we calculate the expected years of service over the first eight years of the Army career. (In making these calculations, we use all available year groups after year group 84, during each year group's first eight years of service.)

The computation tracks each individual from September 30 of one year to September 30 of the following year. We sort the individual ROTC officers by the type of school awarding their bachelor's degrees. If the officer's bachelor's degree information is missing or invalid, we do not include that person, although corrected information later on would mean inclusion in a later year's calculation. For most of the time span, we believe that we capture 90 percent of the officers and do not believe that this selection is systematically biased.

Tables B.1 through B.4 report on the data and results. Table B.1 contains the annual percentage of officers who start a given year of service and retain for one year. For example, the first entry in the table indicates that of all the HBCU graduate officers in the active force on September 30 of the year they enter, 97.1 percent of them are in the active force one year later. Table B.2 multiplies these percentages together to compute the expected fraction of officers remaining on active duty after a given number of years of service. Table B.3 shows the computation of expected years of service for each individual year, then the total over eight years. We assume that accessions and departures occur evenly throughout the year, but we actually observe

individuals starting on their first September 30. Since the average officer would already have served half a year by that point, we add 0.5 years to the first-year expected years of service for this time before the first September 30 we observe. We also use the average of adjacent cumulative rates in Table B.2 as an estimate of the average percentage on active duty during the years. For example, the fraction of a given cohort on active duty over the period from year 1 to year 2 is given by the average of the cumulative retention 0 to 1 and 0 to 2. This same fraction is the expected years of service over that one-year period. We then sum these one-year expected years of service over 8 years.

Table B.4 reports the number of valid records used in the computations of Tables B.1–B.3. The numbers generally decline with years of service because of attrition and because we restrict the year group to 84 and later, so there are fewer year groups for the later years of service.

Table B.1

Annual Retention Rates for ROTC Officers

Year of Service	HBCU	Public	Prestigious Private	Other Private	Military
0 to 1	97.1%	98.4%	98.5%	98.7%	99.5%
1 to 2	97.5%	97.9%	98.1%	98.1%	98.1%
2 to 3	92.8%	93.3%	95.4%	95.3%	93.2%
3 to 4	82.0%	83.9%	81.8%	82.7%	84.0%
4 to 5	86.6%	84.0%	68.9%	77.2%	83.8%
5 to 6	92.6%	89.9%	84.3%	87.2%	90.7%
6 to 7	94.5%	92.3%	85.8%	90.8%	92.7%
7 to 8	93.0%	90.8%	87.2%	91.2%	93.3%

NOTE: Year groups 84–93 used in calculation. Each year tracks individuals from September 30 to the following September 30.

Table B.2

Cumulative Retention Rates for ROTC Officers

Year of Service	HBCU	Public	Prestigious Private	Other Private	Military
0 to 1	97.1%	98.4%	98.5%	98.7%	99.5%
0 to 2	94.7%	96.4%	96.6%	96.8%	97.6%
0 to 3	88.0%	89.9%	92.2%	92.2%	91.0%
0 to 4	72.1%	75.5%	75.5%	76.3%	76.4%
0 to 5	62.5%	63.4%	52.0%	58.9%	64.0%
0 to 6	57.8%	57.0%	43.8%	51.3%	58.1%
0 to 7	54.6%	52.6%	37.6%	46.6%	53.8%
0 to 8	50.8%	47.7%	32.8%	42.5%	50.2%

Table B.3

Expected Years of Service for ROTC Officers

Year of Service	HBCU	Public	Prestigious Private	Other Private	Military
0 to 1	1.49	1.49	1.49	1.49	1.50
1 to 2	0.96	0.97	0.98	0.98	0.99
2 to 3	0.91	0.93	0.94	0.94	0.94
3 to 4	0.80	0.83	0.84	0.84	0.84
4 to 5	0.67	0.69	0.64	0.68	0.70
5 to 6	0.60	0.60	0.48	0.55	0.61
6 to 7	0.56	0.55	0.41	0.49	0.56
7 to 8	0.53	0.50	0.35	0.45	0.52
Total	6.52	6.57	6.13	6.42	6.65

NOTE: 0 to 1 row includes 0.5 year for the average time before the first September 30 of an officer's career.

Table B.4

Number of Valid ROTC Officer Records

Year of Service	HBCU	Public	Prestigious Private	Other Private	Military
0 to 1	1,352	11,586	1,440	3,827	1,481
1 to 2	1,834	14,787	1,778	4,734	1,911
2 to 3	1,762	13,979	1,632	4,359	1,769
3 to 4	1,521	12,236	1,437	3,883	1,541
4 to 5	1,098	9,145	1,029	2,854	1,133
5 to 6	807	6,490	610	1,850	807
6 to 7	667	5,083	431	1,354	600
7 to 8	499	3,645	282	968	415

Appendix C

TIER IA SCHOLARSHIP ANALYSIS AND IMPLEMENTATION

Cadet Command's and our initial analysis of the first year results of the tiered scholarship program suggested that the Army risked making almost all prestigious private school Army ROTC programs nonviable. Based on this early analysis, we proposed and Cadet Command agreed to provide higher-value scholarships for cadets at these schools. The Army adopted an approach called the Tier IA scholarship plan. This plan is now incorporated into the more comprehensive proposals detailed in Chapter Five.

Maintaining programs at private schools with high academic quality seems to require high-value scholarships. To maintain some of these programs, the scholarship program has to build a critical mass of cadets from the national scholarship program. PMSs (Professors of Military Science) at many of these schools have told us that the four-year scholarship winners provide the core of their program, since they start the program off with a critical mass and thereby enable it to recruit some on-campus students in order to meet commissioning missions. Our recommended approach to maintaining these programs was to offer higher-value scholarships in a Tier IA level, with a specific award procedure.

ANALYSIS

Possible alternatives for the Tier IA scholarship plan had two key dimensions: the award value and the school selection. We considered three alternatives for the value of the scholarships. One award value was a high cap—similar to the Tier I scholarship, but at a level between $17,000 and $20,000. Another alternative was to pay 100 per-

cent of the tuition, and a third alternative was to pay a percentage, but less than 100 percent, of tuition.

We also considered three alternatives for school choice. School choice could have been completely free, partially free, or constrained. One alternative was to allow Tier IA awards to be used at any school. A second approach was to base selection of a Tier IA award on the student's choice of schools as expressed on the scholarship application. A third approach was to base the Tier IA award on the student's three choices of college but restrict all Tier IA awards to a limited group of schools. Our proposed program took this third approach, since it is the only way to reliably encourage distribution of scholarship cadets to several programs, each with a critical mass of cadets.

Tier IA awards were in addition to any award a student is otherwise entitled to. Each Tier IA school could only receive a limited number of scholarships. The awards proceeded in Order of Merit List (OML) order but use a criterion of a minimum 1200 on the combined SAT to award Tier IA scholarships. When all of these Tier IA schools had been awarded their full quota of offers, no more Tier IA offers were made.

If the student's first school choice was a Tier IA school, then we checked to see if that school was already filled up with its quota of Tier IA offers. If not, we offered the student a Tier IA. If it was filled, we checked the student's second and third choices to see if they were Tier IA schools and repeated this process. If the first choice was not a Tier IA school, then we followed this procedure for the second or third choice. So each Tier IA student may have ended up with a Tier IA offer to one school, provided there was room at a school of the student's choice. Tier IA offers were made only to students interested in a school on the Tier IA school list. In addition, each school received no more Tier IA scholarships than its allotment. A few other students who did not receive a Tier IA offer—for example, because their SAT score was a bit less than 1200—might have enrolled with another ROTC scholarship award. But we did not expect many students to make that choice, because of the large uncovered costs without the Tier IA award.

SELECTION OF SCHOOLS

In considering which schools might be worthwhile sites to preserve programs, we looked for a method that considers the general quality of the school and the scholastic aptitude of its students. In order to place liberal arts colleges and major universities on an equal footing, we examined host programs that showed an average SAT over 1200 for the officers they commissioned in recent years. Sixteen Army host programs at private schools fell into this category, as shown in Table C.1. (There were also four public schools that met this SAT criterion: University of Michigan, University of Missouri at Rolla, University of Virginia, and Virginia Polytechnic Institute.)

The first question that naturally arose was whether students can accurately predict where they will go to school. Using the 16 high-SAT private schools in Table C.1, we determined that students have been very successful in predicting their attendance. In fact, of all the four-year scholarship winners in the past 10 years who attended a high-SAT private school, 77 percent of them listed that school as one of their three choices on their application. In addition, we knew that the Navy ROTC has implemented a priority choice system in which the student's three school choices on the application determined where the student received a targeted Navy scholarship.

Table C.1

Private Schools with Army ROTC Host Battalions, SAT over 1200

Bucknell University	Lehigh University
Claremont McKenna College	MIT
Cornell University	Princeton University
Davidson College	St. John's University (Minn.)
Duke University	University of Notre Dame
Fordham University	University of Pennsylvania
Georgetown University	Wake Forest University
The Johns Hopkins University	Washington University

THE SAT CRITERION

We further investigated the usefulness of the SAT criterion. To do that, we considered the four-year scholarship takers enrolled in any Army ROTC program who indicated one of these 16 high-SAT private colleges, and then we calculated the fraction who enrolled in the college they indicated compared to enrolling somewhere else. Figure C.1 shows that for students with high SAT scores, a high percentage enrolled at the college they selected. For lower SAT scores, only a low percentage of students enrolled when they expressed interest in these high-SAT schools, presumably in part because lower-SAT students are not able to meet the admissions criteria of these schools. Our plan called for Tier IA offers to be extended to students with relatively high SATs, which would allow Cadet Command to take advantage of the fact that higher-SAT students seemed to have a better chance of attending the school they indicated interest in.

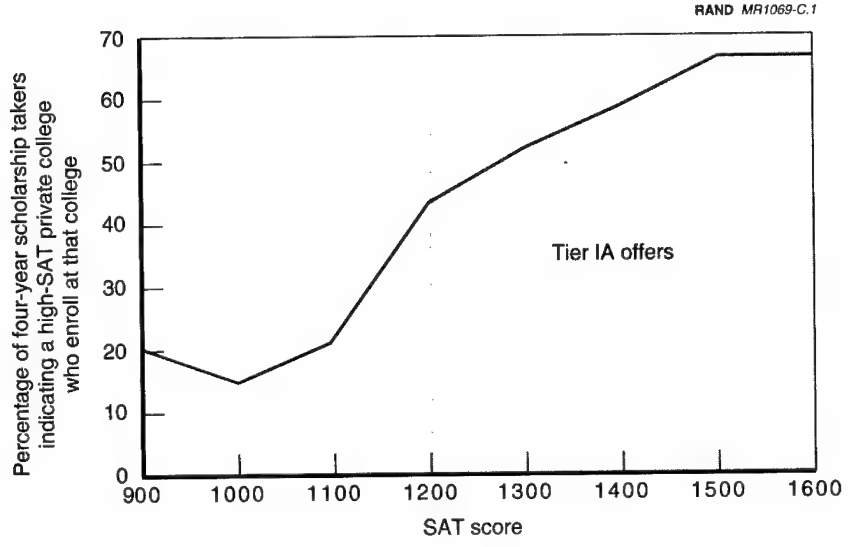


Figure C.1—Effectiveness of SAT Score as Predictor

ADVANTAGES OF THE TIER IA PROGRAM

The Tier IA program we proposed had several advantages. It was designed to maintain a critical mass of scholarship students at some of the prestigious, but expensive, schools. It gave an incentive to students with high academic ability to attend these schools and participate in Army ROTC. It avoided too many students going to any one school and encouraged the distribution of students across schools. It allowed the students substantial freedom of choice. And although the program required some increased work on Cadet Command's part, the increased workload was minimized because of the relatively small number of applicants eligible for Tier IA and the simple criterion for eligibility.

This program was put into place in the 1996–97 and 1997–98 school years, with a cap value of $20,000 at about 30 schools.

Appendix D

INTERVIEW PROTOCOLS

The team used the following protocols when conducting interviews at schools (battalions) and Cadet Command brigades and regions. In all, the team visited seven battalions, three brigades, and two regions.

INTRODUCTION

The RAND Arroyo Center, the Army's federally funded research and development center for studies and analysis, is studying the Army's ROTC scholarship policy. The purpose of our discussions with personnel in the ROTC Regions, Brigades, and Battalions is to gather background information on ROTC programs and impressions of the implementation of the new tiered scholarship policy. All discussions are for background only. No remarks will be attributed to individuals or specific units in any of our findings, briefings, or reports.

Questions for Battalions, Brigades, and Regions

1. How do potential cadets on campus, or in high schools, become aware of ROTC opportunities?
2. What questions do potential cadets ask?
3. What are the reasons cadets give for joining ROTC?
4. How have this year's ROTC applicants reacted to the new scholarship policy?

5. How will the new scholarship policy affect marketing and recruiting strategy?
6. How are the colleges responding to the new scholarship policy (for example, new or upgraded incentives)?
7. What are the components of battalion workload (such as administration, training, counseling, and recruiting)?
8. What are the reasons that cadets choose particular colleges for ROTC?

Additional Questions for Brigades and Regions

1. How are the battalions responding to the new scholarship policy?
2. What effects do you expect to see from scholarship tiering at different schools?
3. How will the new scholarship policy affect operations at the Brigade and Region level?

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